

REMARKS

Claims 1-5 and 18 are pending in this application. Selected claims have been amended to clarify the invention, but not for reasons of patentability. Reconsideration and allowance of all the rejected claims are respectfully requested in view of the following remarks.

Claim Rejections Under 35 U.S.C. §103

Claims 1 and 3-5 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Schmermund (U.S. 6,341,892) in view of Japanese Publication 62-259025 (hereafter JP '025). Further, Claims 1 and 3-5 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Schultz et al. (U.S. 5,053,740) in view of JP '025. Claim 2 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Schmermund (U.S. 6,341,892) in view of JP '025, and in further view of JP 61-179764A. Claim 2 further stands rejected under 35 U.S.C. §103(a) as being unpatentable over Schultz et al. (U.S. 5,053,740) in view of JP '025, and in further view of JP 61-179764A. Claim 18 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Kiec et al. (U.S. 5,134,248) in view of JP '025, Sommer and Wienand (U.S. 5,037,488). For the following reasons, the prior art rejections are respectfully traversed.

The Applicants respectfully submit that neither Schmermund nor JP '025, alone or in combination, teaches or suggests, a flexible wired circuit board having a plurality of layers formed in a generally rectangular, flat, strip-shape, and having a central portion and end portions, for temperature measurement, the layers including: a conductor layer having two sides, a base insulating layer having two sides, wherein one side of the conductor layer is formed on one side of the base insulating layer, wherein the central portion is generally narrow and the end portions

are relatively rectangular, flat and widened, wherein the conductor layer is formed from a metal foil having a proportional relation between temperature and specific electric resistance, wherein the conductor layer includes a temperature detecting portion formed when the conductor layer is formed as a wiring portion and arranged in a predetermined pattern on the base insulating layer, and wherein the temperature detecting portion is formed on the base insulating layer at one of the generally rectangular, flat, widened end portions of the base insulating layer, as recited in Claim 1.

Schmermund discloses a platinum resistance thermometer probe 12 including a stem 13 having a substantially cylindrical shape, and a narrow temperature sensing tip 14 that is an extension of the stem 13 (see Figures 1 and 2; col. 2, lines 20-26). Schmermund further discloses a temperature sensor 15, located on the narrow temperature sensing tip 14, formed on a substrate 17, the substrate 17 having an identical width throughout (see Figure 2; col. 2, lines 27-31). The probe 12, including the narrow temperature sensing tip 14, is inserting into a housing 26, the housing 26 itself includes a temperature sensing tip 28, and keeps the internal environment in a contaminant free partial vacuum (see col. 1, line 46 to col. 2, line 5). The space inside of the housing 26 that is not occupied by the temperature sensor 15 is filled with fine granular particles 33 (see Figures 1 and 2; col. 2, lines 47-64), which provide mechanical support to the temperature sensor and reduces convection.

JP '025 discloses a heat sensitive sensor used as a fire detector, which includes sensor tapes 2 that are stuck in parallel on the surface of a base tape 1, which is made from a heat shrinking stock. Further, a self-adhesive agent 3 is coated over the entire surface of the base tape

1. A sensor tape 5 is stuck to the prescribed length within a fire monitoring area and is connected to a detecting part (see Figure 1; Abstract).

First, the Applicants respectfully submit that the Examiner is incorrect in not taking the preamble into account in construing the claim. The Examiner is reminded that any terminology in the preamble that limits the structure of the claimed invention must be treated as a claim limitation. See, e.g., *Corning Glass Works v. Sumitomo Elec. U.S.A.*, 868 F.2d 1251, 1257, 9 USPQ2d 1962, 1966 (Fed. Cir. 1989), and MPEP §2111.02.

Also, the Applicants respectfully submit that the preamble breathes "life, meaning and vitality" into the claim, and that the limitations in the body of the claim refer back to the preamble, providing patentable weight to the structure of the layers (i.e., the temperature detecting portion is formed on the base insulating layer at one of the flat, widened end portions of the flexible wired circuit board). See *Pitney Bowes Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165-66 (Fed. Cir. 1999) and MPEP §2111.02.

Thus, the flexible wired circuit board and its structural features should be given patentable weight by the Examiner. However, the claim has been amended to place limitations previously in the preamble into the body of the claim to expedite the prosecution of the case, but not for reasons of patentability.

Turning to the present rejection, the Applicants respectfully submit that Schmermund is non-analogous art, and one of ordinary skill in the art of flexible wired circuit boards would not have looked to platinum resistance thermometers in order to achieve the claimed features of a

temperature detecting portion for a flexible wired circuit board for use in automotive temperature control.

Further, the Applicants respectfully submit that Schmermund does not teach or suggest the widened end portions that the Examiner alleges. The entire width of the substrate 17 is identical throughout (the Examiner's designated areas A-C are identical in width), and there is no differentiation between a narrower central portion and wider end portions as in the present invention.

Still further, the Examiner's allegation that JP '025 teaches or suggests this shape is incorrect. The Figures of JP '025 do not show a flexible wired circuit board, but rather, a completely different device – a base of heat shrinking stock with sensor tapes thereon, which is rectangular in shape, with no narrower central portion or widened end portions as in the present invention.

The Applicants also respectfully submit that Schmermund and JP '025, are complete within themselves, and there is no motivation to combine Schmermund with JP '025 to achieve the claimed features of the present invention, without the use of impermissible hindsight by the Examiner.

Specifically, the Applicants respectfully submit that there is no motivation to change the device of Schmermund to add a base of heat shrinking stock having sensor tapes as in JP '025. Although the Examiner acknowledges that Schmermund does not disclose a flexible wired circuit board, and that Schmermund does not disclose or suggest the particular shape of the

board, JP '025, on whom the Examiner relies, does not disclose these features either, and fails to make up for the deficiencies in Schmermund.

In particular, one of ordinary skill in the art of flexible wired circuit boards would not have looked to the fire protection device of JP '025 to combine with a calibratory platinum resistance thermometer, in order to achieve the claimed features of the present invention. The sensor tapes of JP '025 are meant to be used in the open to detect changes in temperature that would indicate a fire, whereas the sensing tip 14 of Schmermund is meant to be contaminant free within its housing 26. Thus, there is no motivation to combine these two references to achieve the claimed features of the present invention.

Further, assuming *arguendo*, that Schmermund and JP '025 were combined, the resulting combination would not achieve the claimed features of the present invention, and in fact, would make at least, the Schmermund device unworkable. The addition of the rectangular, parallel, sensor tapes of JP '025 instead of Schmermund's resistance temperature sensor 15 and platinum resistor 16, would cause Schmermund to be inoperable, since the sensor tapes are made to work in an open environment and not a hermetic housing, and would still not reach the claimed features of the present invention. The Examiner is reminded that if the proposed modification renders the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) (see §MPEP 2143.01).

Accordingly, Claim 1 is not obvious over either the individual or the combination of the Schermund and JP '025 references, and the rejection of Claim 1 under 35 USC §103 should be withdrawn.

Further, since Claims 3-5 depend from Claim 1, they are also patentably distinguishable over either the individual or the combination of the Schermund and JP '205 references, for the reasons cited above with respect to Claim 1.

With respect to the Examiner's rejection of Claim 1 over the combination of Schultz et al. and JP '025, the Applicants respectfully submit that neither the individual nor the combination of the Schultz et al. and JP '025 references teaches or suggests a flexible wired circuit board having a plurality of layers formed in a generally rectangular, flat, strip-shape, and having a central portion and end portions, for temperature measurement, the layers including: a conductor layer having two sides, a base insulating layer having two sides, wherein one side of the conductor layer is formed on one side of said-base insulating layer, wherein the central portion is generally narrow, wherein the end portions are relatively rectangular, flat and widened, wherein the conductor layer is formed from a metal foil having a proportional relation between temperature and specific electric resistance; wherein said conductor layer includes a temperature detecting portion formed when said conductor layer is formed as a wiring portion and arranged in a predetermined pattern on said base insulating layer; and wherein the temperature detecting portion is formed on the base insulating layer at one of the generally rectangular, flat, widened end portions of the base insulating layer.

Schultz et al. only discloses a temperature sensor for a heating oven, including a square-shaped planar metal panel or substrate 12, with a layer of porcelain enamel 14, on which a metal panel 12 is exposed with an element 16 deposited thereon, the element 16 and the panel 12 are identical in width.

First, as stated above with respect to Schmermund and JP '025, Schultz is non-analogous art to the present invention. One of ordinary skill in the art of flexible wired boards would not have looked to heating oven temperature sensors in order to achieve a temperature detecting portion for a flexible wired circuit board for use in automotive temperature control.

Further, Schultz does not disclose or suggest the widened end portions that the Examiner alleges. The entire width of the element 16 and panel 12 is identical throughout, and there is no differentiation between a narrower central portion and wider end portions as in the present invention.

Still further, the Examiner's allegation that JP '025 teaches or suggests this shape is incorrect for the reasons stated above.

The Applicants also respectfully submit that Schultz et al. and JP '025, are complete within themselves, and there is no motivation to combine Schultz et al. with JP '025 to achieve the claimed features of the present invention, without the use of impermissible hindsight by the Examiner.

Specifically, the Applicants respectfully submit that there is no motivation to change the device of Schultz et al. to add a base of heat shrinking stock having sensor tapes as in JP '025. Although the Examiner acknowledges that Schultz et al. do not disclose a flexible wired circuit

board, and that Schultz et al. do not disclose or suggest the particular shape of the board, JP '025, on whom the Examiner relies, does not disclose these features either, and fails to make up for the deficiencies in Schultz et al.

In particular, one of ordinary skill in the art of wired circuit boards would not have looked to a fire protection device of JP '025 to combine with a heating oven temperature sensor, in order to achieve the claimed features of the present invention. The sensor tapes of JP '025 are meant to be used in the open to detect changes in temperature that would indicate a fire, whereas the temperature sensor of Schultz et al. is coated with porcelain enamel 14. Thus, there is no motivation to combine these two references to achieve the claimed features of the present invention.

Still further, assuming *arguendo*, that Schultz et al. and JP '025 were combined, the resulting combination would not achieve the claimed features of the present invention, and in fact, would make the Schultz et al. device unworkable. The addition of the rectangular sensor tapes of JP '025 onto Schultz et al.'s porcelain coated square-shaped planar metal substrate, would cause Schultz et al. to be inoperable, and would still not reach the claimed features of the present invention. The Examiner is reminded that if the proposed modification renders the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) (see MPEP §2143.01).

Accordingly, Claim 1 is not obvious over either the individual or the combination of the Schultz et al. and JP '025 references, and the rejection of Claim 1 under 35 USC §103 should be withdrawn.

Further, since Claims 2-5 depend from Claim 1, they are also patentably distinguishable over either the individual or the combination of the Schultz et al. and JP '205 references, for the reasons cited above with respect to Claim 1.

With respect to Claim 2, the addition of the JP 61-179764A reference does not make up for the deficiencies of Schmermund and JP '025, nor the deficiencies in Schultz et al. and JP '025, and thus should be allowed at least by virtue of its dependency from Claim 1, but also because it is distinguishable over the applied prior art.

With respect to Claim 18, the Applicants respectfully submit that neither the individual nor the combination of the Kiec, JP '025, Sommer, nor Wienand references teaches or suggests a flexible wired circuit board having a plurality of layers formed in a generally rectangular, flat, strip-shape, and having a central portion and end portions, for temperature measurement, said layers including: a conductor layer having two sides and formed from a stainless foil, a base insulating layer having two sides and being formed from a polyimide film, wherein one side of the conductor layer is formed on one side of the base insulating layer, a cover insulating layer formed from a polyimide film, and formed on another side of said conductor layer, wherein the central portion is generally narrow, wherein the end portions are relatively rectangular, flat and widened, wherein said conductor layer, comprising a main wiring portion for wiring and a sensor-wiring portion, including a temperature detecting portion formed in one piece in a form of

a predetermined pattern, and wherein the temperature detecting portion is formed on the base insulating layer at one of the generally rectangular, flat, widened end portions of the base insulating layer.

Kiec discloses a rectangular thin film electrical connector as a resistance temperature device, with a conductive material 12 that is bonded between a substrate 16 and a barrier, and electrical leads 14 which are connected to the metal film 12.

Wienand discloses a circular shaped temperature sensor for use in mechanically oscillating systems including a protective tube 8 having a temperature sensor 11, a springy carrier board 1 with conductive tracks 2, 3 and terminals 4-7 for a signal transmission conductor. The carrier 1 is mounted, under spring tension, facing the inner surface of the protective tube 8. The conductive tracks 2, 3 run parallel to the axis of the protective tube 8.

Finally, Sommer discloses a circular thin-film thermistor made of a circular polyimide film 11, having a thermistor material 13 on the film, and electrodes 15 thereon. A stainless steel mask 18 is placed over the film 11 so that the material will be selectively deposited in two strips 17.

The Examiner acknowledges that Kiec does not disclose that the conductor is stainless steel, a polyimide insulating layer and the shape of the flexible wired circuit board, and relies on JP '025, Wienand and Sommer to disclose these features.

First, the Applicants respectfully submit that the arguments presented in the October 13, 2005 Amendment, apply, and that the addition of JP '025 does not make up for the deficiencies in Kiec, Wienand and Sommer.

As stated above, JP '025 is non-analogous art to the other references, and also, fails to teach or suggest these features of the present invention, at least, with respect to a temperature detecting portion located at a "widened" end portion from a narrower central portion, as discussed above with respect to Claim 1.

Further, none of the applied prior art references discloses or suggests the widened end portions that the Examiner alleges.

The Applicants also respectfully submit that the Kiec, JP '025, Wienand, and Sommer references, are complete within themselves, and there is no motivation to combine these references to achieve the claimed features of the present invention, without the use of impermissible hindsight by the Examiner.

Specifically, the Applicants respectfully submit that there is no motivation to change the thin film electrical connector of Kiec to add a base of heat shrinking stock having sensor tapes as in JP '025, in order to achieve the claimed features of the present invention.

Further, the Applicants respectfully submit that there is no motivation to add the fire protection device sensor tapes of JP '025 to the end portion of Kiec's strip-shaped electrical connector, which is used to connect to electrical leads. Rather, Kiec's device depends upon the temperature sensing conductor 12 being connected to the electrical leads, and the addition of the sensor tapes to the temperature sensing conductor 12, would defeat the purpose and operation of the Kiec device.

Still further, assuming *arguendo*, that Kiec and JP '025 were combined, the resulting combination would not achieve the claimed features of the present invention, and in fact, would

make the Kiec device unworkable. The addition of the rectangular, sensor tapes of JP '025 onto Kiec's electrical connector would cause Kiec to be inoperable, and would still not reach the claimed features of the present invention. The Examiner is reminded that if the proposed modification renders the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) (see §MPEP 2143.01).

Accordingly, Claim 18 is not obvious over either the individual or the combination of the Kiec, JP '025, Wienand, and Sommer references, and the rejection of Claim 18 under 35 U.S.C. 103 should be withdrawn.

Finally, the Applicants respectfully remind the Examiner that to establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. (See MPEP §2143). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Furthermore, the Examiner is reminded that "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." (*In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006) cited with approval in KSR).

The Applicants also respectfully submit to the Examiner that since there is no suggestion or motivation, either in Schmermund, Schultz, Kiec, JP '025, Wienand, or Sommer, or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine the references teachings, the Examiner has failed to establish a *prima facie* case of obviousness. Further, since the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

If the Examiner believes that there is any issue which could be resolved by a telephone or personal interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

Applicants hereby petition for any extension of time that may be required to maintain the pendency of this case, and any required fee for such an extension is to be charged to Deposit Account No. 50-0951.

Respectfully submitted,

Jean C. Edwards

Jean C. Edwards
Registration No. 41,728

(57362)
AKERMAN SENTERFITT
801 Pennsylvania Avenue N.W.
Suite 600
Washington, D.C. 20004
202-824-1724 - phone
202-824-1791 – fax
Date: October 11, 2007